PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Thomas M. BREUEL et al.	Group Art Unit: 2178
Application No.: 10/064,892	Examiner: C. PAULA
Filed: August 27, 2002	Docket No.: 111744

For: METHOD AND SYSTEM FOR DOCUMENT IMAGE LAYOUT DECONSTRUCTION AND REDISPLAY SYSTEM

BRIEF ON APPEAL

Appeal from Group 2178

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Xerox Corporation, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 013025, Frame 0904.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellants, Appellants' representative, or the Assignee, that may be related to, or that will directly affect or be directly affected by or have a bearing upon, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1, 3-13, 16 and 18-28 are on appeal.

Claims 1, 3-13, 16 and 18-28 are pending.

No claims are allowed, and no claims are objected to only for being dependent from a rejected base claim, but are otherwise allowable.

Claims 1, 3-13, 16 and 18-28 are rejected.

No claims are withdrawn from consideration.

Claims 2, 14-15 and 17 are canceled.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed. The claims stand as amended by Appellants' August 24, 2007 Amendment.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a method of converting a document in a page-image format into a form suitable for an arbitrarily sized display (see paras. [0005] and [0033]-[0039] and Fig. 3), comprising in sequential order: deconstructing a document in a page image format (see paras. [0033]-[0036], elements 300-340 in Fig. 1, elements 190, 200 in Fig. 2 and steps 100, 110, 120, 130, 140 and 150 in Fig. 3) into a set of segmented image elements (see para. [0037] and step 160 in Fig. 3); synthesizing the deconstructed document (see paras. [0037]-[0038] and [0042]-[0043] and steps 180, 190 in Figs. 1 and 3) into an intermediate data structure (see paras. [0038] and [0043] and element 260 in Fig. 2 and steps 200, 210 in Fig. 3) that is convertible into a commercially available format (see paras. [0039]-[0041] and Fig. 3); and distilling the intermediate data structure for redisplay (see para. [0039] and step 220 in Fig. 3) by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display (see paras. [0040]-[0044] and Fig. 3) wherein the intermediate data structure is automatically adaptable at the time of display to constraints of any display device or circumstance of viewing (see paras. [0022]-[0023], [0039] and [0043]-[0044], and Fig. 3).

Claim 16 is directed to a system for converting a document in a page-image format into a form suitable for an arbitrarily sized display (see paras. [0005] and [0045] and Fig. 4), the system comprising: an input/output device (see paras. [0047] and [0051] and element 410 in Fig. 4); a controller (see paras. [0047] and [0051] and element 420 in Fig. 4); a deconstructing circuit, routine or application (see para. [0047] and element 440 in Fig. 4) that deconstructs a document (see paras. [0052]-[0054] and Fig. 4); a synthesizing circuit routine or application (see para. [0047] and element 450 in Fig. 4) that synthesizes the deconstructed document into an intermediate data structure into a format usable for reflow on an arbitrarily sized display (see para. [0055] and Fig. 4), the intermediate data structure being automatically adaptable at the time of display to constraints of the arbitrarily sized display (see paras. [0043], [0054] and

[0058]); a memory (see para. [0048] and element 430 in Fig. 4), wherein: the deconstructing circuit, routine or application first deconstructs the document in a page image format into non-text image areas, layout properties, and a set of compressed segmented image elements (see paras. [0053]-[0054] and element 440 in Fig. 4); the synthesizing circuit, routine or application then synthesizes the non-text image areas, the layout properties, and the set of segmented image elements into the intermediate data structure (see para. [0055] and element 450 in Fig. 4); and the distilling circuit, routine or application (see para. [0056] and element 460 in Fig. 4) then distills the intermediate data structure for redisplay in the format usable for reflow on an arbitrarily sized display (see paras. [0056]-[0057] and element 460 in Fig. 4).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1) Claims 1, 3-13, 16 and 18-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 7,028,258 to Thacker et al. (hereinafter "Thacker") in view of U.S. Patent No. 6,895,552 to Balabanovic et al. (hereinafter "Balabanovic").

VII. ARGUMENT

The Office Action rejects the pending claims as having been obvious in view of the applied references. However, with respect to at least claims 1 and 16, the Examiner has improperly applied the law relating to obviousness. Proper application of the law, and reasonable interpretation of the references, demonstrates that the relevant standard for obviousness has not been met, and that the claimed subject matter is allowable over the applied references.

A. CLAIMS 1 AND 16 WOULD NOT HAVE BEEN OBVIOUS OVER THACKER IN VIEW OF BALABANOVIC

Thacker is not reasonably combinable with Balbanovic in the manner suggested. Thacker is directed to systems and methods for dynamic pagination on a given device (Abstract). Thacker teaches a method where a document is partitioned into multiple segments, and the predetermined segments are then paginated into pages by inserting page breaks (col. 4, lines 13-17; 33) at which time selected pages may be displayed on a device (see, e.g. col. 4, lines 37-39; Fig. 1(b); col. 5, lines 4-28). In such a device, the parameters of, for example, a display device 406, are preset.

The Office Action merely asserts that Thacker discloses dividing a document, which is an electronic version of a paper document, based on the disclosure of Thacker at col. 3, lines 59-67, and col. 5, lines 56-64. The analysis of Thacker is no more detailed than that. The Office Action then concedes that Thacker fails to explicitly teach deconstructing a document in a page image format as is positively recited, among other features, in independent claims 1 and 16. Rather, the Office Action relies on Balabanovic as teaching what is regarded by the Office Action as "a well-known technique of decomposing a scanned bitmap image into blocks." The Office Action then concludes it would have been obvious to one of ordinary skill in the art at the time of the invention to deconstruct a scanned document, and OCR it to convert it into text that can be used to pour the document into slots that fit the

screen size of the device to display the document "because of all the reasons found in Thacker including optimizing an electronic version of a paper document for display in different devices" (col. 2, lines 11-19).

This analysis of the Office Action fails to take into account positive disclosures in Thacker such as, for example, at col. 4, lines 33-41, in which Thacker specifically teaches that "[i]n paginating the segment 104 into different pages, it is noted that embodiments of the invention do not lay out, or render, each individual page within the segment, but rather only determine where the page breaks within the segment 104 lies" (emphasis added). Thacker explains the advantages of its approach are adapted to a device having a limited amount of volatile memory, and a relatively slow processor. The objective advantage of the Thacker method then is that "[b]y only entering one predetermined segment 104 into memory at a given time (as opposed to entire document 100, for example), memory is conserved." It is unreasonable, therefore, to assert that one of ordinary skill in the art would have been, in any way, motivated to modify Thacker in a manner which unnecessarily complicates it and specifically renders Thacker inoperable to its intended purpose.

In other words, to modify the Thacker method to include features related to reflow on an arbitrarily-sized display would unnecessarily complicate the Thacker method. Thacker receives a document in a page-image format in which the constraints of the display device are known. As such, it would not have been obvious to make any modification directed at deconstructing and/or synthesizing the document in a page-image format in the manner recited in claims 1 and 16, only to then adapt it to a display that was already known.

The above-referenced portion of Thacker deals with the benefits of segmenting a document into portions, such as chapters of a book, where only one "segment" at a time has to be paginated on-the-fly (col. 2; lines 11-19). Further references to 'segmenting' throughout Thacker consistently describe a method of segmenting single, individual segments at a time

(see, e.g. col. 4, lines 19-22; 33; 53-54; 61-67, col.. 5, lines 15-20; 25). Thus, in Thacker only the currently desired page of the segment needs to be rendered for display, and this occurs in a preset manner, not in any reflow manner.

Likewise, the statement in Thacker that, by paginating pages dynamically, electronic books can "look quite good" on devices such as palm-sized personal computers to larger monitors also fails to provide any basis for one skilled in the art to predictably include any capability for distilling an intermediate data structure synthesized from a deconstructed document for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display, wherein the intermediate data structure is automatically adaptable at the time of display to constraints of any display device or circumstance of viewing.

B. THACKER FAILS TO DISCLOSE THE FEATURES UPON WHICH THE OFFICE ACTION RELIES UPON THAT REFERENCE AS TEACHING

Thacker fails to disclose additional features relied upon by the Office Action. The Office Action asserts that Thacker discloses "dividing a document." However, in Thacker, the document 100 is in a format where text may be included in a series of slots of a page. Thacker teaches segmenting a document, such as into chapters or articles, to provide for quicker dynamic pagination, in that the entire electronic book does not have to be paginated dynamically, but only the current segment of interest (see, e.g., col. 8, lines 41-47). Thacker is not directed to a method of converting a document in a page-image format. The Office Action asserts that Thacker discloses distilling the intermediate data structure for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display, wherein the intermediate data structure is automatically adaptable at the time of display to constraints of any display device or circumstance of viewing. However, as conceded by the Office Action, Thacker does not disclose synthesizing a deconstructed

document into an intermediate data structure. Therefore, it is improper for the Office Action to rely on Thacker as disclosing the specific features of then somehow manipulating recited intermediate date structure that the Office Action concedes Thacker does not include.

Additionally, Thacker cannot reasonably be considered to disclose distilling an intermediate data structure for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display. Thacker does not discuss converting an intermediate data structure into a format usable for reflow on an arbitrarily sized display. The method of Thacker assumes a current position in the text defined by the paginatable segment, each of a number of pages has a predetermined number of slots, and predetermined page layouts (see, col. 8, lines 63 - col. 9, line 5).

C. BALABANOVIC DOES NOT TEACH THE FEATURES UPON WHICH THE OFFICE ACTION RELIES UPON THAT REFERENCE AS TEACHING

Balabanovic is directed to a system and method of provisionally summarizing a document (Abstract). Balabanovic seeks to overcome what is considered to be a shortfall in the prior art in that "generally a first page of a document is arbitrarily chosen to represent the document regardless of whether the visual appearance of the first page provides a visual cue for association with the particular document" (col. 1, lines 24-27). With reference to col. 5, lines 50-67, the Office Action alleges that Balabanovic teaches a well-known technique for decomposing the scanned bitmap image into block. Balabanovic, in the cited portion, discusses deconstructing a document in order to extract certain features such that an "end result of document analysis is a set of feature descriptions for each document page." Balabanovic then goes on to categorize as text, a picture, or line art each of the segmented blocks. The visual information in a given page is ultimately represented by some vector by which a visual saliency is then evaluated. The Balabanovic process renders a display of a selected page, not necessarily the first page, of a document based on an evaluated saliency of

that document. It is unreasonable based on the totality of the disclosure of Balabanovic to assert that it, in any way, teaches deconstructing a page in a page image format into a set of segmented image elements, synthesizing the deconstructed document into an intermediate data structure which may, in any way, be usable in a method that distills the intermediate data structure for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display structure. Any intermediate data structure provided in Balabanovic is concerned with assigning a relative order of merit to the saliency of a specific item displayed or a specific page to an overall representation of the document. The data resulting from the deconstruction of Balabanovic may provide an intermediate data structure, but not such a structure that is further manipulable to provide the sort of reflow of a document into an arbitrarily sized page as is recited in the pending claims, even if Thacker had any such capability, which he does not.

D. NO OBJECTIVE EVIDENCE OF RECORD IS PROVIDED TO SUPPORT THE CONCLUSION THAT ONE OF ORDINARY SKILL IN THE ART WOULD HAVE PREDICTABLY COMBINED THACKER WITH BALABANOVIC IN THE MANNER SUGGESTED WITH ANY REASONABLE EXPECTATION OF SUCCESS

In recent prosecution of this application, Appellants have routinely argued that this combination of applied references would not have been predictably combined in the manner suggested by the Office Action. Thacker is concerned with segmenting documents to facilitate a simple pagination process in devices having limited memory and slow processors. Balabanovic is concerned with manipulating data regarding a document in order to find some representative page to display in order to quickly evaluate whether a user may want to access the particular document represented. On their face, these references are not combinable in the manner suggested. The mere conclusory statements made by the Office Action do not meet

the applicable standard for asserting obviousness with respect to the combination of applied references.

The proper standard to determine obviousness requires that (1) the Examiner step backward in time into the shoes of the hypothetical "person of ordinary skill in the art," (2) "[i]n view of all of the factual information, the Examiner must then make a determination whether the claimed invention 'as a whole' would have been obvious at the time to that person," and (3) any knowledge gained from Appellants' disclosure must be put aside at reaching the determination in order to avoid the tendency to resort to the impermissible application of hindsight reasoning based on Appellants' disclosure. Clearly, there is nothing in Thacker or Balabanovic to suggest that one of ordinary skill in the art at the time of Appellants' invention would have, in any obvious way, predictably combined these references in the manner suggested by the Office Action.

Further, the required showing has not been made by any objective evidence of record. To any extent that Balabanovic teaches some form of deconstruction of information presented on a page, Balabanovic is further directed at mathematically modified page information in order to pick the best page for display. The Office Action stretches the limits of reasonability in determining that either of the Thacker or Balabanovic references can be relied upon as teaching the features that the Office Action asserts. Following that the Office Action asserts the unreasonable conclusion that the feature extraction methodology of Balabanovic would have been combined with the segmented deconstruction of Thacker by one of ordinary skill in the art. The analysis of the Office Action fails to show any predictability to making the asserted combination with any reasonable expectation of success in achieving any of the objectives that are intended to be achieved by, and in the manner of, the subject matter of the pending claims.

Even post-*KSR*, the analysis supporting an obviousness rejection must be explicit. It also must be reasonable. *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S., 127 S. Ct. 1727 (2007). The Supreme Court in *KSR* approved the conclusions set forth in the decision of the Federal Circuit in *In re Kahn*, 441 F.3d 977 (Fed. Cir. 2006) that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." This standard is not met here with the conclusory statement that it would have allegedly been obvious to modify Thacker by including deconstruction to an intermediate data structure (unusable by Thacker) that would support being reflowed in some manner by Thacker (in a manner that Thacker would not eve have suggested), as allegedly taught by Balabanovic, for the purpose of reflowing a document into an optimal line-by-line presentation on a display of varying sizes.

Finally, exemplary rationales to guide the obviousness analysis in supporting a rejection under 35 U.S.C. §103, in light of the Supreme Court's decision in *KSR* have been provided as guidance to Examiners. The mandate of this guidance is that "[t]he key to supporting any rejection under 35 U.S.C. §103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." The pending obviousness rejections do not comply with this standard, nor is any attempt made by the Office Action to frame the asserted obviousness rejection over this combination of applied references under any of the exemplary rationales set forth in the Patent Office's guidance to its Examiners.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejection under 35 U.S.C. § 103(2) is in error as to claims 1 and 16, and, therefore, also to each of the claims depending respectively therefrom. Claims 1, 3-13, 16 and 18-28 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of claims 1, 3-13, 16 and 18-28.

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Filed: August 5, 2008

APPENDIX A - CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1. A method of converting a document in a page-image format into a form suitable for an arbitrarily sized display, comprising in sequential order:

deconstructing a document in a page image format into a set of segmented image elements;

synthesizing the deconstructed document into an intermediate data structure that is convertible into a commercially available format; and

distilling the intermediate data structure for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display,

wherein the intermediate data structure is automatically adaptable at the time of display to constraints of any display device or circumstance of viewing.

2. (Canceled)

3. The method of claim 1, wherein deconstructing a document in a page image into the set of segmented image elements includes at least one of physical segmentation of data and logical segmentation of data.

4. The method of claim 1, wherein the set of segmented image elements comprises at least one of blocks, lines, words, characters of text, groups of characters, and groups of non-text characters.

5. The method of claim 1, wherein synthesizing includes converting non-text image areas, layout properties and segmented image areas into the intermediate data structure.

6. The method of claim 1, wherein synthesizing the set of segmented image elements into an intermediate data structure includes integrating at least one of bitmapped images in an intelligible display layout and links to non-textual elements.

7. The method of claim 6, wherein the bitmapped images are images of words in reading order.

8. The method of claim 1, wherein the intermediate data structure is stored in a storage device.

9. The method of claim 1, wherein distilling the intermediate data structure for redisplay in a format usable for reflow on an arbitrarily sized display, includes redisplaying the document in human readable format.

10. The method of claim 1, wherein distilling the intermediate data structure for redisplay in a format usable for reflow on an arbitrarily sized display, includes redisplaying the document in at least one of an electronic book format, Internet browsable format and a print format.

11. The method of claim 1, wherein distilling the intermediate data structure includes converting the stored intermediate data structure into a device specific display format for display.

12. The method of claim 1, wherein the intermediate data structure is adaptable to at least one of display screen size, page size, resolution, contrast, color and geometry, at the time of display.

13. The method of claim 1, wherein the intermediate data structure is adaptability supported by at least one of repagination of text, logical links of text to associated text and non-textual content.

14-15. (Canceled)

16. A system of converting a document in a page-image format into a form suitable for an arbitrarily sized display, comprising:

an input/output device;

a controller;

a deconstructing circuit, routine or application that deconstructs a document;

a synthesizing circuit, routine or application that synthesizes the deconstructed document into an intermediate data structure that is convertible into a commercially available format;

a distilling circuit, routine or application that distills the intermediate data structure for redisplay by converting the intermediate data structure into a format usable for reflow on an arbitrarily sized display, the intermediate data structure being automatically adaptable at the time of display to constraints of the arbitrarily sized display;

a memory, wherein:

the deconstructing circuit, routine or application first deconstructs the document in a page image format into non-text image areas, layout properties, and a set of compressed segmented image elements;

the synthesizing circuit, routine or application then synthesizes the non-text image areas, the layout properties, and the set of segmented image elements into the intermediate data structure; and

the distilling circuit, routine or application then distills the intermediate data structure for redisplay in the format usable for reflow on an arbitrarily sized display.

17. (Canceled)

18. The system of claim 16, wherein the deconstructing circuit, routine or application deconstructs the document in a page image format into the set of segmented image elements that includes at least one of physical segmentation of data and logical segmentation of data.

19. The system of claim 16, wherein the intermediate data structure includes at least one of bitmapped images in an intelligible display layout and links to non-textual elements.

20. The system of claim 19, wherein the bitmapped images are images of words in reading order.

21. The system of claim 16, wherein the memory stores at least one of the document in page image format, the deconstructed document, the intermediate data structure and the distilled document.

22. The system of claim 16, wherein the distilling circuit, routine or application distills the intermediate data structure for redisplay of the document in a format usable for reflow on an arbitrarily sized display includes redisplaying the document in at least one of an electronic book format, Internet browsable format, and a print format.

23. The system of claim 16, wherein the distilling circuit, routine or application converts the stored intermediate data structure into a device specific display format for display.

24. The system of claim 16, wherein the intermediate data structure is adaptable to at least one of display screen size, paper size, resolution, contrast, color and geometry, at the time of display.

25. The system of claim 16, wherein the intermediate data structure is adaptability supported by at least one of repagination of text, logical links of text to associated text and non-textual content.

26. The system of claim 16, wherein the deconstructing circuit, routine or application analyzes page layout and converts a sequence of page images into a sequence of document element images captured in a tagged format; and

the distilling circuit, routine or application converts the tagged format into at least one of an electronic book format, an Internet browsable format that can accept images and a print format.

27. The system of claim 26, wherein the tagged format preserves at least one of reading order and logical page layout properties.

28. The system of claim 26, wherein the deconstructing routine includes a segmentation algorithm and a background structure analyzer.

APPENDIX B - EVIDENCE APPENDIX

NONE

APPENDIX C - RELATED PROCEEDINGS APPENDIX

NONE